Amendments to the Claims:

A listing of the entire set of pending claims (including amendments to the claims, if any) is submitted herewith per 37 CFR 1.121. This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently amended) A system for improving performance of wireless communications comprising:

a transmitter ~~producing~~ that is configured to produce a modulated data signal ~~combined with~~ that includes an addition of one or more supplemental signals on ~~various~~ a plurality of frequencies to an input data signal within a monocarrier channel employed to transmit the modulated data signal; and

a receiver that is configured to use ~~employing~~ the one or more supplemental signals to compute a frequency domain channel estimate for use in equalizing the channel during demodulation of the data signal.

2. (Currently amended) The system ~~as set forth in~~ of claim 1, wherein:

the one or more supplemental signals each employ a different frequency ~~which~~ that changes during each of a plurality of periods, ~~wherein~~ and

the time-varying frequency for each supplemental signal changes from one period to a subsequent period in a predetermined sequence of frequencies within the channel.

3. (Currently amended) The system ~~as set forth in~~ of claim 2, wherein

the predetermined sequence spans frequencies within the channel to directly provide a frequency domain channel estimate.

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4. (Currently amended) The system ~~as set forth in~~ of claim 2, wherein the predetermined sequence is coordinated with a field sync within the modulated data signal.

5. (Currently amended) The system ~~as set forth in~~ of claim 2, wherein the one or more supplemental signals are each transmitted with a power selected to ~~minimize~~ avoid interference with demodulation of the data signal without reference to the one or more supplemental signals.

6. (Currently amended) The system ~~as set forth in~~ of claim 2, wherein the time varying frequency cycles through ~~all~~ a plurality of frequencies within the predetermined sequence at a rate sufficient to permit multiple channel estimates for a single field of the modulated data signal.

7. (Currently amended) The system ~~as set forth in~~ of claim 2, wherein: the predetermined sequence is coordinated with a field sync within the modulated data signal, and ~~wherein~~ the one or more supplemental signals are each transmitted with a power selected to ~~minimize~~ avoid interference with demodulation of the data signal without reference to the one or more supplemental signals.

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8. (Currently amended) A transmitter for improved wireless communications comprising:

a symbol source producing a data signal;

a waveform generator producing a time-varying signal ~~which~~ that changes frequency during each of a plurality of periods, wherein

the frequency changes from one period to a subsequent period in a predetermined sequence of frequencies within a channel to be employed in transmitting the data; and

a modulator producing a transmission signal from a ~~combination~~ sum of the data signal and the time-varying signal.

9. (Currently amended) The transmitter ~~as set forth in~~ of claim 8, wherein

the predetermined sequence spans the channel to directly provide a frequency domain channel estimate.

10. (Currently amended) The transmitter ~~as set forth in~~ of claim 8, wherein

the predetermined sequence is coordinated with a field sync within the data signal.

11. (Currently amended) The transmitter ~~as set forth in~~ of claim 8, wherein

the time-varying signal is transmitted with a power selected to ~~minimize~~ avoid interference with demodulation of the data signal without reference to the time-varying signal.

12. (Currently amended) The transmitter ~~as set forth in~~ of claim 8, wherein

the time varying signal cycles through ~~all~~ each of the frequencies within the predetermined sequence at a rate sufficient to permit multiple channel estimates for a single field of the data signal.

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13. (Currently amended) The transmitter ~~as set forth in~~ of claim 8, wherein:

the predetermined sequence is coordinated with a field sync within the data signal, and ~~wherein~~

the time-varying signal is transmitted with a power selected to ~~minimize~~ avoid interference with demodulation of the data signal without reference to the time-varying signal.

14. (Currently amended) The transmitter ~~as set forth in~~ of claim 8, wherein

the time-varying signal is one of a plurality of time-varying signals each having a different frequency during a period and each changing frequency from one period to a subsequent period in the predetermined sequence of frequencies.

15. (Original) A receiver for improved wireless communications comprising:

an equalizer performing channel equalization on a received signal utilizing a channel estimate; and

a coherent demodulator producing the channel estimate from the received signal and a time-varying signal corresponding to a portion of the received signal, wherein

the time-varying signal changes frequency during each of a plurality of periods, wherein

the frequency changes from one period to a subsequent period in a predetermined sequence of frequencies within a channel on which the received signal is received.

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16. (Currently amended) The receiver ~~as set forth in~~ of claim 15 ~~further comprising~~, including:

a waveform generator producing the time varying-signal,

wherein

a period duration and the predetermined sequence match a corresponding period duration and predetermined sequence employed in generating the received signal.

17. (Currently amended) The receiver ~~as set forth in~~ of claim 16, wherein:

the waveform generator produces a plurality of time-varying signals each having a different frequency during a period and each changing frequency from one period to a subsequent period in the predetermined sequence of frequencies, ~~wherein~~ and

the coherent demodulator produces the channel estimate from the received signal and each of the time-varying signals.

18. (Currently amended) The receiver ~~as set forth in~~ of claim 15, wherein

the predetermined sequence spans frequencies within the channel to directly provide a frequency domain channel estimate.

19. (Currently amended) The receiver ~~as set forth in~~ of claim 15, wherein

the predetermined sequence is coordinated with a field sync within the received signal.

20. (Currently amended) The receiver ~~as set forth in~~ of claim 15, wherein

the time varying frequency cycles through ~~all~~ each of the frequencies within the predetermined sequence at a rate sufficient to permit multiple channel estimates for a single field of the received signal.

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21. (Currently amended) The receiver ~~as set forth in~~ of claim 15 ~~further comprising,~~ including:

a channel estimate post-processor that is configured to:

_____smooth~~ing~~ the channel estimate,

_____track~~ing~~ time varying fades within the channel estimate, and

_____produc~~e~~ing Doppler estimates for the channel estimate.

22. (Currently amended) A method of wireless communication, comprising:

~~combining a data signal with~~ adding one or more supplemental signals on ~~various~~ a plurality of frequencies to a data signal within a monocarrier channel; and

~~employing the one or more supplemental signals to compute~~ computing a frequency domain channel estimate for use in equalizing the channel during demodulation of the data signal based on the one or more supplemental signals.

23. (Currently amended) The method ~~as set forth in~~ of claim 22, wherein: ~~the step of combining a data signal with one or more supplemental signals on various frequencies within a monocarrier channel further comprises: combining the data signal with~~

the one or more supplemental signals each ~~employing~~ use a different frequency ~~which~~ that changes during each of a plurality of periods, and ~~wherein~~

the time-varying frequency for each of the supplemental signals changes from one period to a subsequent period in a predetermined sequence of frequencies within the channel.

24. (Currently amended) The method ~~as set forth in~~ of claim 23 ~~further comprising:~~ including

periodically changing a frequency for each supplemental signal in a predetermined sequence spanning frequencies within the channel, to directly provide a frequency domain channel estimate.

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25. (Currently amended) The method ~~as set forth in~~ of claim 23 ~~further comprising:~~, including

coordinating the predetermined sequence with a field sync within the data signal.

26. (Currently amended) The method ~~as set forth in~~ of claim 23 ~~further comprising:~~, including

sweeping each supplemental signal through ~~all~~ each of the frequencies within the predetermined sequence at a rate sufficient to permit multiple channel estimates for a single field of the data signal.

27. (Currently amended) The method ~~as set forth in~~ of claim 22 ~~further comprising:~~, including

providing each of the supplemental signals with a power selected to ~~minimize~~ avoid interference with demodulation of the data signal without reference to the one or more supplemental signals.

28. (Currently amended) The method ~~as set forth in~~ of claim 22 ~~further comprising~~, including:

periodically changing a frequency for each supplemental signal in a predetermined sequence of frequencies within the channel coordinated with a field sync within the data signal; and

providing each of the supplemental signals with a power selected to ~~minimize~~ avoid interference with demodulation of the data signal without reference to the one or more supplemental signals.

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29. (Currently amended) A method for improved wireless communications, comprising:

producing a data signal;

producing a time-varying signal ~~which~~ that changes frequency during each of a plurality of periods, wherein

the frequency changes from one period to a subsequent period in a predetermined sequence of frequencies within a channel to be employed in transmitting the data; and

producing a transmission signal from a ~~combination~~ sum of the data signal and the time-varying signal.

30. (Currently amended) The method ~~as set forth in~~ of claim 29, wherein

the predetermined sequence spans the channel to directly provide a frequency domain channel estimate.

31. (Currently amended) The method ~~as set forth in~~ of claim 29, wherein

the predetermined sequence is coordinated with a field sync within the data signal.

32. (Currently amended) The method ~~as set forth in~~ of claim 29, wherein

the time-varying signal is provided with a power selected to ~~minimize~~ avoid interference with demodulation of the data signal without reference to the time-varying signal.

33. (Currently amended) The method ~~as set forth in~~ of claim 29, wherein

the time varying signal cycles through ~~all~~ each of the frequencies within the predetermined sequence at a rate sufficient to permit multiple channel estimates for a single field of the data signal.

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34. (Currently amended) The method ~~as set forth in~~ of claim 29, wherein:

the predetermined sequence is coordinated with a field sync within the data signal, and ~~wherein~~

the time-varying signal is transmitted with a power selected to ~~minimize~~ avoid interference with demodulation of the data signal without reference to the time-varying signal.

35. (Currently amended) The method ~~as set forth in~~ of claim 29, wherein

the time-varying signal is one of a plurality of time-varying signals each having a different frequency during a period and each changing frequency from one period to a subsequent period in the predetermined sequence of frequencies.

36. (Currently amended) A method for improved wireless communications, comprising:

receiving a received signal that includes a data signal and a concurrently transmitted equalization signal;

generating a time-varying signal corresponding to the concurrently transmitted equalization signal;

producing ~~the~~ a channel estimate from the received signal and ~~a~~ the time-varying signal ~~corresponding to a portion of the received signal~~, wherein

the time-varying signal changes frequency during each of a plurality of periods, wherein

the frequency changes from one period to a subsequent period in a predetermined sequence of frequencies within a channel on which the received signal is received; and

demodulating the data signal based on a ~~performing~~ channel equalization ~~on~~ of the received signal utilizing the channel estimate.

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37. (Currently amended) The method ~~as set forth in~~ of claim 36 ~~further comprising:~~, including

producing the time varying-signal with a period duration and the predetermined sequence matching a corresponding period duration and predetermined sequence employed in generating the received signal.

38. (Currently amended) The method ~~as set forth in~~ of claim 37 ~~further comprising:~~, including

producing a plurality of time-varying signals each having a different frequency during a period and each changing frequency from one period to a subsequent period in the predetermined sequence of frequencies,

wherein

the channel estimate is produced from the received signal and each of the time-varying signals.

39. (Currently amended) The method ~~as set forth in~~ of claim 36, wherein

the predetermined sequence spans frequencies within the channel to directly provide a frequency domain channel estimate.

40. (Currently amended) The method ~~as set forth in~~ of claim 36, wherein

the predetermined sequence is coordinated with a field sync within the received signal.

41. (Currently amended) The method ~~as set forth in~~ of claim 36, wherein

the time varying frequency cycles through all frequencies within the predetermined sequence at a rate sufficient to permit multiple channel estimates for a single field of the received signal.

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42. (Currently amended) The method ~~as set forth in~~ of claim 36 ~~further comprising,~~ including:

smoothing the channel estimate,

tracking time varying fades within the channel estimate, and

producing Doppler estimates for the channel estimate.

43. (Currently amended) A wireless communication signal, comprising:

a data signal; and

at least one supplemental signal ~~combined~~ summed with the data signal,

the at least one supplemental signal having a frequency ~~which~~ that changes during each of a plurality of periods in a predetermined sequence of frequencies for a channel in which the wireless communication signal is transmitted.

44. (Currently amended) The wireless communications signal ~~as set forth in~~ of claim 43 wherein

the predetermined sequence of frequencies spans the channel.

45. (Currently amended) The wireless communications signal ~~as set forth in~~ of claim 43, wherein

the predetermined sequence is coordinated with a field sync within the data signal.

46. (Currently amended) The wireless communications signal ~~as set forth in~~ of claim 43, wherein

the at least one supplemental signal sweeps the predetermined sequence at a rate sufficient to permit multiple channel estimates based on the at least one supplemental signal within a single ~~filed~~ field of the data signal.

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47. (Currently amended) The wireless communications signal ~~as set forth in~~ of claim 43, wherein

the at least one supplemental signal has a power sufficiently less than a power for the data signal to permit demodulation of the data signal without reference to the at least one supplemental signal.

48. (Currently amended) The wireless communications signal ~~as set forth in~~ of claim 43, wherein

the at least one supplemental signal ~~further comprises~~ includes:

a plurality of supplemental signals each having a different frequency during a given period and each changing frequencies in the predetermined sequence from one period to a subsequent period.

49. (Currently amended) The wireless communications signal ~~as set forth in~~ of claim 43, wherein

the wireless communications signal is a result of modulating the ~~combination~~ sum of the data signal and the at least one supplemental signal.